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Working Paper

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Kiel Working Paper, No. 352

Provided in Cooperation with:
Kiel Institute for the World Economy (IfW)

Suggested Citation: Schweickert, Rainer (1989) : Government regulations, external financing, and economic performance: the case of Korea, Kiel Working Paper, No. 352

This Version is available at:
http://hdl.handle.net/10419/499

Kieler Arbeitspapiere
Kiel Working Papers

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by
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ISSN 0342-0787

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January 1989

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Contents

* This paper is part of a research project on the optimal structure of capital transfers from developed to developing countries; financial support of the Deutsche Forschungsgemeinschaft is gratefully acknowledged.

I. Introduction*

Together with some Latin American countries, Korea represented one of the world's major borrowers, before it began to reduce foreign indebtedness recently. Nevertheless remarkable differences exist with regard to the structure of capital inflows. Since 1965 Korea attracted foreign capital nearly exclusively in the form of debt. The debt/GNP ratio peaked at 53.5 per cent in 1982 (Collins, Park, 1987a, p. 4). Inflows of foreign direct investment (fdi) remained negligible (Table A1). Consequently, the ratio of fdi-stocks over the stock of fdi plus debt was extremely low in Korea, amounting to 3 per cent in 1983. Substantially higher ratios were recorded for other major debtors such as Brazil (20 per cent), Chile (17 per cent), and Mexico (13 per cent) (Corsepius, 1988a, p. 37). Again in sharp contrast to Latin American countries, high external indebtedness went along with favourable economic performance in Korea. During the 1965-1986 period, the average economic growth rate amounted to 8.6 per cent.

Both observations, i.e., the exceptional structure of external financing and the favourable economic performance, may in fact be interrelated[1]. This hypothesis refers to a choice-theoretic model which analyzes the international transfer of capital on the basis of an agent-principal approach. It is shown that transfer negotiations between foreign lenders or investors (principals) and the authorities in the recipient country (agent) can result in a first-best "cooperative" or second-best "non-cooperative" equilibrium (Lächler, 1985). The impact of capital inflows on economic performance of the recipient country depends on which of both regimes is realized. In a non-cooperative situation, the borrower fails to precommit himself credibly to a certain investment behaviour. Under such conditions, the choice between equity and

[1] Similar studies on the relation between the external financing structure and economic performance were undertaken for Chile and Mexico (Corsepius, 1988a; 1988b).

* Support from Peter Nunnenkamp is gratefully acknowledged.

debt finance may involve a risk-return trade-off between income stability and expected growth. A higher proportion of equity inflows reduces the variability of the agent's domestic absorption. At the same time, the incentives to generate and invest domestic savings are supposed to be weaker than in the case of debt finance. Consequently, future growth prospects are diminished.

The non-cooperative situation has been considered as typical for the recent past (Lächler/Nunnenkamp, 1987). However, some agents may have succeeded to engage in cooperative relations with foreign principals. Korea may provide a case in point. Whether or not a cooperative solution is reached ultimately depends on the terms for debt and fdi transfers which are set by the principal. But the agent can influence the principal's decision by signalling that he is prepared to engage in cooperative relations. The institutional framework governing the allocation and use of foreign funds is likely to play a prominent role in this respect. In the case of Korea, the publicly enforced orientation towards investment and exports may have rendered the principals confident about the country's willingness and ability to guarantee an efficient use of transferred funds. The favourable economic performance of Korea may then be attributable to cooperative terms of capital transfers, i.e., better terms than granted to the bulk of developing countries.

Government interventions may not only influence the terms of capital inflows. They also affect the structural composition of resource inflows. Moreover, government interventions may have a direct impact on the growth effects of different capital inflows insofar as the model assumptions on the investment behaviour of the agents are modified. In the case of Korea, this factor can be expected to be of utmost importance. The Korean economy is highly regulated although it is frequently considered as a market economy. Financial market regulations have been a major instrument in government allocation policies.

In the following, the predictions of the principal-agent model on the effects of different capital inflows on economic performance

in Korea are subjected to an empirical test. Section II outlines the choice-theoretic model and clarifies whether transfer negotiations yielded a cooperative or non-cooperative equilibrium in the case of Korea. Chapter III analyzes how Korean policies affected the structure of capital inflows over the 1973-1987 period and discusses the effects of regulations on the investment behaviour of the agent. In Section IV the impact of different types of capital inflows on key macroeconomic variables is tested empirically. The results are interpreted within the agent-principal framework. In the final chapter the summary of the analysis undertaken in this paper leads to some policy conclusions.

II. Theoretical Framework

1. The Basic Model

The relationship between foreign financing and domestic savings and investment is the subject of a long debate in the literature on development finance. Most empirical studies concluded that an additional Dollar of foreign capital increases total savings by less than one Dollar[1]. Research focused on distinguishing the effects of private versus public transfers and aid versus non-concessional external finance. The distinction between debt and fdi which figures prominently in the following principal-agent model was typically neglected.

In the underlying model (Lächler 1985; Lächler, Nunnenkamp, 1987), the capital transfer between foreign lenders and investors (principals) and the recipient country (agent) is typically characterized by an informational assymetry: Once the money is transferred, the principal does not know which proportion the agent invests in income-generating activities. He merely observes total

[1] For an overview of empirical studies which measured the effects of foreign capital on domestic savings, domestic investment and economic growth, see Sharma (1983).

output which is not only a function of realized investment but also of random variables. As the agent allocates the transferred resources between consumption and investment the following disincentive (moral hazard) problems arise:

- In the case of equity participation, the agent can be expected to invest a smaller share of domestic absorption compared to a situation where foreign resources are available as a gift. Since the principal is entitled to a predetermined share of future output, the agent may improve his own welfare position by shifting domestic absorption to current consumption.

- In the case of debt finance, the principal is entitled to a fixed sum of debt service payments. Relative to a gift-transfer the agent will then choose riskier projects. It is favourable for the agent to raise the variance of returns from investments in order to maximize his own welfare at the expense of the principal.

Moral hazard of the agent threatens to reduce the expected gains of the principal. Assuming that principals behave rationally, they anticipate the agent's behaviour and modify the terms under which the transfer is made. The agent who receives foreign capital under these harder conditions is then forced to a non-cooperative investment behaviour.

The aforementioned disincentive problems may be overcome, if the agent was able to precommit himself credibly to a certain investment behaviour. In such a cooperative environment the model hypothesizes that the investment response (I) to a transfer (T) obeys the following pattern:

$$(1)\quad dI/dT\Big|_{AID} \leq \left(dI/dT\Big|_{EQUITY}, dI/dT\Big|_{DEBT}\right), \text{ with } 0 \leq dI/dT\Big|_{AID} \leq 1$$

According to (1), the recipient country invests a relatively larger share if the transfer involves future repayment obliga-

tions. However, if the transfer negotiations result in a non-cooperative solution the change in domestic investment after an increased equity inflow may be negative, while more external debt always leads to more investment. Under non-cooperative conditions the following pattern is expected:

$$(2)\quad dI/dT\Big|_{EQUITY} \leq dI/dT\Big|_{AID} \leq dI/dT\Big|_{DEBT} \quad \text{with } 0 \leq dI/dT\Big|_{AID} \leq 1$$

The pattern of coefficient values - as given in (1) and (2) for investment - is supposed to hold for changes in economic growth and domestic savings (DS) in response to increased transfers as well. Real economic growth is assumed to be a stochastic function of investment. The response of domestic savings to aid inflows is bounded by:

$$-1 \leq dDS/dT\Big|_{AID} \leq 0^{1}.$$

2. The Transfer Negotiations in the Case of Korea

Since the economic performance effects of capital inflows depend on the outcome of transfer negotiations, it is necessary to get an idea if Korea has to be characterized as a cooperative or a non-cooperative case. The model suggests that the agent may signal that he is prepared to engage in cooperative relations. A high investment ratio, successful mobilization of domestic savings and the use of funds according to the country's comparative advantage may provide such indicators, which ensure the principal that his funds are invested productively rather than consumed. Ultimately it depends on the terms at which the principal is willing to transfer capital to the agent whether or not a cooperative equilibrium is reached.

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[1] This results from the definition of domestic savings which is DS = I - T.

The crucial role of high investments for economic growth was stressed in all Korean Five-Year Plans since 1962 (Collins/Park, 1987a, p. 15). Reflecting this policy goal, the investment ratio averaged 27.1 per cent during the 1965-1985 period, compared with 23.6 per cent for all developing countries (data from IMF, 1987). Temporary plunges of domestic savings were compensated by foreign borrowing in order to fill the gap between desired investment and available domestic savings[1]. Moreover, despite these plunges, a remarkable secular rise in the savings ratio can be observed, and government savings remained positive since 1962. In 1986 the savings ratio even outpaced the high investment ratio. There can thus be no doubt that, concerning the criterion of high investment and mobilization of domestic savings, Korea behaved in a cooperative manner.

The picture is less straightforward with regard to the riskiness of investments. After promoting exports of labour-intensive manufactures, the government favoured heavy and chemical industries in the 1973-1979 period, most of which are known as skill and technology-intensive (Park, 1976, p. 1028). The heavy industrialization program granted preferential access to financial funds and reinforced import protection for privileged sectors. As a consequence, heavy industries characterized by high loan/value added ratios and low gross rates of return expanded as strongly as labour-intensive industries during the 1971-1982 period (Hong/Park, 1986, pp. 168-172).

The strong focus on heavy industrialization was probably in conflict with Korea's comparative advantages. Nevertheless the boom of Korean exports continued; exports soared by an average of 39.6 per cent annually in the 1973-1979 period (Collins/Park, 1987a, pp. 9, 11). Export promotion which was a major goal of government policy in Korea since the first Five-Year Plan continued to be of

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[1] This was especially true in 1974/75 and 1979/80, i.e., after the two oil price shocks. During the whole period 1965-1986, the investment ratio showed a smaller standard deviation than the savings ratio although its mean was substantially higher. This underlines that high and stable investments were of first priority.

high priority. Table A2 shows that privileged access to credits represented a major instrument of export promotion in the 1970s. Additionally, interest rates on loans to export oriented industries were substantially lower than for domestic market oriented industries[1]. Arguably, foreign principals referred to favourable export conditions and the strong world market performance in the first place when assessing the riskiness of their engagement in Korea. Consequently cooperative terms would have been granted notwithstanding the risk-increasing reorientation in economic policies towards heavy and chemical industries.

Actually, the average costs of foreign loans to Korea were considerably lower than for other developing countries. This is evident from information on interest rate spreads over LIBOR which indicate the lender's (principal's) risk assessment, i.e., whether or not cooperative terms are granted. In the period 1976 to 1984, average interest rate spreads amounted to 1.02 percentage points for Korea, compared with 1.20 percentage points for a sample of 21 developing countries and 1.35 percentage points for nine major problem borrowers (Nunnenkamp/Junge, 1985, p. 57). Spreads were relatively high in Korea in 1976 (1.92 percentage points, compared with 1.8 percentage points for all developing countries) which may indicate that lenders were aware of the riskiness of the promotion of heavy and chemical industries. Subsequently, however, spreads declined substantially. In 1984, only marginal differences in spreads prevailed between Korea and major industrial countries (0.65 versus 0.61 percentage points).

All in all, there are strong indications that principal-agent relationships can be considered as cooperative in the case of Korea. Therefore, the investment response of external finance is expected to obey the pattern of equation (1) rather than equation (2).

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[1] Differences in ratios of total (domestic and foreign) loans over total assets between these two sectors ranged from 2.5 to 16.9 percentage points. The maximal difference in average costs of borrowing was 5 percentage points.

III. Government Policies and Capital Inflows

1. The Relevance of the Regulative Framework

The predictions of the principal-agent model refer to the effects of different capital inflows on investment in the first place. Since economic growth is portrayed as a stochastic function of investment the growth effects of external finance are supposed to follow the pattern of equation (1) as well. Implicitly it is assumed that all investments are equally efficient. Foreign capital inflows are considered as perfectly fungible (Lächler, 1985). Once the transfers are made the government agent can dispose of those funds for either consumption or investment purposes.

Actually the government's leverage to determine the use and thus the efficiency of foreign capital inflows may differ between the various types of external finance. The government agent can freely dispose of resources directly transferred to him and immediately determine the efficiency of foreign aid and public debt for example. The efficiency of fdi and private debt inflows can only be influenced indirectly by the government, even though the public guidance of the private sector is fairly strong as was the case in Korea. Government regulations may modify the incentives of the recipients of foreign capital as to how to use the resources transferred. Moreover, the strong involvement of the Korean government in allocating foreign resource inflows between sectors is likely to change the growth impact of investments. Favourable growth effects of the promotion of heavy industries, for example, may materialize with considerable delay at best. The ranking of the growth effects as given in equation (1) is thus likely to be affected by the degree and nature of interventions concerning the transfer of foreign resources. Against this background, the analysis proceeds by evaluating government regulations which influenced capital inflows to Korea in the 1965-1986 period.

2. Changes in the Regulative Framework

The Korean policies towards fdi in the 1960s and 1970s can be characterized by three main features. First, fdi policies were selective with respect to both the nationality of foreign investors and the sectors designated for investment. In 1966 and 1973 the fear of a surge of Japanese investment was the reason to make regulations more restrictive (Lee, 1987, p. 19; Kim, 1976, p. 384). The heavy industrialization strategy of the 1973-1979 period had as a consequence that sector-specific discriminations became more pronounced. Secondly, a stop-and-go attitude prevailed, as reflected in frequent changes in the regulative framework. Restrictive policies were relaxed whenever the country experienced foreign exchange problems, e.g. in 1974 after the first oil price shock, and re-introduced afterwards. Thirdly, minority-owned joint ventures were favoured with only few exceptions. Small-scale investments were ruled out. All these factors were likely to weaken the growth impact of fdi in Korea.

The restrictive fdi regulations were not effectively enforced before 1973, which was due to the lack of administrative capabilities and the need for foreign exchange. The new Foreign Capital Inducement Act (FCIA) of 1973 provided a major change in this respect (Lee, 1987, pp. 19ff.). The act introduced criteria which rendered the following projects ineligible to foreign investors:

- projects that would solely aim at providing support for existing firms;
- projects that would solely aim at profiting from land use;
- projects that would disrupt domestic demand and supply of raw materials and intermediate products;
- projects that would compete in overseas markets with domestic firms.

Especially the last two criteria indicate that the Korean authorities relied on domestic investors whenever possible. The arti-

ficial reduction of competitive pressure is likely to have negatively affected the efficiency of investments and therefore economic growth. Moreover, the eligibility criteria were sufficiently unclear so that all or no foreign direct investment could be approved, although a positive list of sectors open to foreign direct investment existed. The restrictive approval procedure and the uncertainty about its outcome caused considerable costs for potential foreign investors. Consequently, fdi inflows kept very low compared with debt inflows until 1984.

The Foreign Capital Inducement Act provided the major instrument to allocate fdi to priority sectors designated by the government. The promotion of heavy and chemical industries in the 1973-1979 period is reflected in Table A8 showing the industrial composition of fdi. Comparing 1972-1976 with 1977-1981, the share of heavy industries and chemicals[1] in total fdi in manufacturing rose from 54.5 to 61.7 per cent; the share of the chemical industry jumped from 9.9 to 30.6 per cent. On the other hand, the sharp decline in the share of textiles from 21 to 0.4 per cent is particularly noteworthy.

The allocation of fdi to heavy industries is likely to have further reduced the growth impact of fdi in the short run. At least some of the priority sectors did not conform to Korea's comparative advantages. Especially the chemical industry belonged to the group of highly skill and technology-intensive sectors and experienced significantly lower gross rates of return on capital than the average of manufacturing industries (Hong/Park, 1986, p. 169). A favourable growth impact of fdi in heavy industries can be expected to materialize with considerable delay only. The efficiency of fdi may be affected by the strong preference of the Korean government for large-scale investments and minority-owned joint ventures as well. Small-scale investments were prohibited

[1] Calculated by subtracting food, textiles and others from total manufacturing.

or discriminated although they may be particularly efficient. The inability of foreign investors with minority stakes to control the use of their funds may have rendered them reluctant to transfer productivity-increasing technologies.

Entrance barriers for fdi were very high in Korea. Once approved, however, considerable tax concessions were granted. Both domestic and foreign investors could choose one of the following three alternative tax incentives when engaged in heavy and chemical industries:

- exemption of corporate taxes for three years and a reduction to 50 per cent in the following two years;
- tax credits;
- accelerated depreciation allowances.

An additional incentive scheme was available for foreign investors exclusively. They benefitted from tax exemptions of several income and property taxes for five years and a reduction of these taxes to 50 per cent for the following three years. Consequently, the tax incentives discriminated not only between industries but privileged foreign against domestic investors as well.

Moreover, import protection was reinforced during the period of heavy industrialization. The proportion of items which could be imported without prior government approval declined from 61.7 per cent in 1968 to 50.5 per cent in 1976. This development was even more pronounced in the machinery industry (including the so-called strategic industries) where the import liberalization ratio declined from 55.9 per cent to 35.4 per cent in the same period (Koo, 1984b, p. 12).

Two effects can be expected from subsidization and import protection. First, the incentives for an efficient use of investment funds were weakened. Since subsidies were higher for foreign

investors, the efficiency of fdi is likely to be affected in the first place. Secondly, the privileged treatment of foreign investors may have led to a crowding out of domestic investors. This tendency was reinforced by the fact that capital-intensive fdi projects absorbed domestic and foreign savings available to the economy. Consequently, the overall investment response of fdi may be lower than suggested by the agent-principal model.

Only recently the government changed its restrictive and selective policy towards fdi gradually. The re-orientation in overall industrialization policies in 1980 is reflected in the revision of the FCIA in 1984 (Koo, 1984b, pp. 30-33). A negative list of projects not eligible to foreign investment was introduced. As shown in Table A3, 69 per cent of all sectors and 86.3 per cent of manufacturing industries were now open to fdi. This represents a substantial liberalization compared to the former positive list. Projects not on the negative list were approved automatically if they met criteria referring to ownership, investment amount and tax exemptions asked for. This lowered uncertainty and entry costs substantially. Increasing fdi inflows were recorded following the policy change. This increase occurred although general tax exemptions were abolished (Ministry of Finance, 1987, pp. 18f.) and discriminations between industries and investors were reduced.

However, the recent changes in policies towards fdi are unlikely to affect the empirical results in the following section. Hence, government regulations are supposed to have lowered the overall investment and growth impact of fdi in the period under consideration.

Foreign loans accounted for the bulk of foreign capital flows to Korea throughout the 1967-1985 period. Foreign borrowing had to be approved by the Economic Planning Board. Guarantees for repayment were available since 1962 (Park, 1986, p. 1026). They were issued to the lender by the Bank of Korea after the approval.

Since 1966, the (government owned) commercial banks played a significant role in issuing payment guarantees as well (Park, 1984, p. 28). Guarantees were taken up in 1971 when the domestic cost of external borrowing jumped up due to a major depreciation of the Won. The government bailed out highly indebted firms facing severe short-term financial problems (Park, 1986, p. 1028), thereby contributing to the credibility of public guarantees. Two effects were to be expected from this experience. First, repayment guarantees gave rise to moral hazard of borrowers. Since they were less responsible for the repayment of borrowed funds, a tendency towards excessive risk-taking was to be expected (Oum, 1988, p. 11). Secondly, the incentives of foreign lenders and domestic intermediaries (i.e., Korean banks) to properly evaluate the credit risks were weakened. This is because foreign lenders were payed by the government in the case of credit failure. The Korean banks could not be made responsible because they issued the guarantee on government instruction.

Public guarantees contributed to the subsidization of domestic users of foreign loans because the risks of repayment were artificially reduced. The attractiveness of foreign credits was further strengthened by negative real costs of borrowing during 1966-1980. Real private costs of borrowing abroad averaged -5.9 per cent in 1976-1980 (Table A4). The inflation rate during this period amounted to 20.7 per cent per annum, while the exchange rate depreciated by only 5.5 per cent. The overvaluation of the Won and the inherent subsidization of foreign borrowing (Park, 1986, p. 1025) encouraged inefficient uses of funds, e.g. the set-up of overcapacities. Between 1975 and 1980, capacity utilization was less than 70 per cent in non-ferrous metal manufacturing and less than 40 per cent in transportation equipment industries (Koo, 1988, p. 11).

As in the case of fdi, foreign loans were mainly attracted to promote heavy industrialization in the 1970s. The approval pro-

cedure resulted in an increasing share of heavy and chemical industries in total foreign borrowing (1966-1970: 22.7 per cent; 1976-1980: 30.8 per cent; for details see Table A7). Consequently, the short-term economic growth effects of debt inflows were likely to be negatively affected as well[1]. Moreover, it is noteworthy that social overhead projects absorbed roughly one third of total foreign loans during 1966-1980 and more than half in 1981/82. As in the case of heavy industries, favourable growth effects of these investments are to be expected in the longer run at best.

The privileged status of priority industries with respect to access to loans and cost of borrowing was not restricted to foreign credits, but applied to domestic loans as well. The subsidization of domestic credits amounted to an average of 10 per cent of GNP in the 1970s (Hong/Park, 1986, p. 168). Taken domestic and foreign funds together, the government controlled more than 50 per cent of the financial needs of the corporate business sector during the 1965-1979 period (Table A6). Since foreign and domestic credits were fungible and a substantial part of foreign funds was channelled through the national banking system, the regression parameters for the external debt variable in Section IV may also carry the impact of domestic credits. The coefficients may be affected as well if borrowers enjoying preferential access to credits engaged in on-lending to sectors which were discriminated by the government's allocation of loans[2]. The negative effect of government regulations on the efficiency of in-

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[1] Again similar to fdi, the allocation of foreign loans favoured large firms. This is reflected in higher ratios between external funds (including foreign credits) and total assets, as compared to small firms. The difference peaked at 21.2 percentage points in 1974 (Table A2). As argued before, competition and therefore efficiency may be reduced due to this discrimination.

[2] This implies that the government's control on the ultimate use of funds was not as strict as was assumed in the preceding paragraphs.

vestments might then be softened. Actually, credits were found to be fungible between the officially promoted heavy industries and non-priority sectors in the 1970s (Hong/Park, 1986, pp. 172-180). Nevertheless the proposition can be maintained that public loan allocation affected the productivity of investments negatively. The capital market in Korea continued to be strongly segmented even if discriminations were reduced by on-lending. Table A2 shows that priority sectors (heavy and chemical industries as well as export oriented industries) experienced significantly higher ratios of total (domestic and foreign) loans over total assets as well as significantly lower capital costs than light and domestic market-oriented industries. Moreover, negative real interest rates on bank loans sharply contrasted with real interest rates of more than 20 per cent in the unorganized curb market (Table A4).

Only since 1980 credit policies changed gradually. Five large state-owned commercial banks were sold to the public. This was supposed to strengthen management responsibility (Collins/Park, 1987b, p. 14), although the government's leverage on commercial banks continued to be high. Interest rates remained officially regulated. However, the access to and the costs of borrowing became more equal across industries (Tables A2 and A5). In 1982 preferential interest rates were abolished for export-oriented industries for example. Moreover, in sharp contrast to the 1970s, real interest rates were positive since 1981. This was due to the reduction in inflation rates from an average of 20.7 per cent per annum in 1976-1980 to 9.8 per cent in 1981-1983 and a simultaneous rise in exchange rate depreciation from 5.5 per cent to 10 per cent (Table A4).

The government's re-orientation in foreign debt policies is clearly reflected by the mid-period adjustment of the Fifth Five-Year Plan in 1982 (Park, 1986, pp. 1038-1040). The priority of high and increased investments was maintained; but investments were to be financed out of domestic savings rather than foreign

debt. A current account surplus was planned for 1987. Actual performance even surpassed the ambitious plan (Table A1). The investment ratio exceeded 30 per cent and domestic savings increased steadily. In 1986 Korea experienced a current account surplus which was as high as the deficit in 1981. The recent developments have to be considered in the following section since they are likely to affect the empirical estimations. The successful mobilization of domestic resources and the focus on reducing foreign indebtedness can be expected to result in negative coefficients for debt inflows in the 1981-1986 period, especially in the case of the investment and savings equations.

IV. The Structure of External Financing and Economic Performance

1. Specification of Hypotheses

The hypotheses on the economic performance effects of cooperative transfer negotiations and government regulations affecting capital inflows in the case of Korea are subjected to empirical tests in the following. Using annual observations, the following basic equation is estimated for the 1965-1986 period:

$$(3)\quad X = a_0 + a_1\ FDI + a_2\ AID + a_3\ DEBT$$

The endogenous variables to be explained in separate regressions are the investment ratio (I), the domestic savings ratio (DS) and real annual growth of GDP (GR). The set of explanatory variables includes foreign direct investment flows to Korea, aid, and total debt inflows.

According to the theoretical framework outlined above, a cooperative equilibrium suggests the following pattern of coefficients:

$$(4)\quad a_1 \geq a_2 \leq a_3.$$

In addition, individual coefficients should satisfy the following constraints:

(5) a) $-1 \leq a_2 \leq 0$ when the endogenous variable is DS,

b) $0 \leq a_2 \leq 1$ when the endogenous variable is I,

c) $a_2 \geq 0$ when the endogenous variable is GR.

Multiple regression analysis is applied to test whether or not the constraints have to be rejected. Additionally, F-tests are employed to test the competing hypothesis that different types of capital inflows do not have a statistically different impact on the endogenous variables:

(6) $a_1 = a_2 = a_3$.

The importance of discriminating among capital inflows will be evaluated by making pair-wise comparisons:

(7) a) $a_1 = a_2$

b) $a_1 = a_3$

c) $a_2 = a_3$

Restriction (7a) is the crucial one for determining the type of equilibrium. While a cooperative equilibrium is characterized by $a_1 \geq a_2$, a non-cooperative equilibrium is characterized by $a_1 \leq a_2$.

In additional estimations, debt inflows are differentiated according to the maturity of credits, the type of borrower, and the type of lender. Long-term debt (DEBT-L) is expected to have a more favourable impact on economic performance than short-term debt (DEBT-S) if the latter is mainly raised to cover temporary

operating deficits of the government and the business sector. Private agents are supposed to use debt inflows (DEBT-Pr) more productively than government agencies (DEBT-Gv). The growth impact of credits provided by private sources (DEBT-Ba) is expected to be larger than the impact of credits from official sources (DEBT-Mu) since the concessionality of the latter may weaken the incentives to use external funds productively. The equations to be estimated are then:

$$(8) \quad x = b_0 + b_1 \text{ FDI} + b_2 \text{ AID} + b_3 \text{ DEBT-L} + b_4 \text{ DEBT-S}$$

$$(9) \quad x = c_0 + c_1 \text{ FDI} + c_2 \text{ AID} + c_3 \text{ DEBT-Gv} + c_4 \text{ DEBT-Pr}$$

$$(10) \quad x = d_0 + d_1 \text{ FDI} + d_2 \text{ AID} + d_3 \text{ DEBT-Mu} + d_4 \text{ DEBT-Ba}$$

2. The Data Base and Methodological Remarks

The main data sources were balance of payments and national accounts statistics. A detailed description of the variables is presented in Appendix 1. Most of the data covered the 1965-1986 period. Data on lending by official and private creditors was only available since 1967.

All equations were estimated using the ordinary-least-squares technique. The Cochrane-Orcutt procedure was applied if results were biased by first-order autocorrelation of the residuals. The figures for the explaining capital inflow variables were standardized by expressing them as percentages of gross national product (GNP). A trend variable (T) was included optionally as a proxy to capture the effects of neglected variables which may not be readily incorporated into the underlying agent-principal model.

Two additional factors had to be taken into account which may lead to biased results otherwise:

- As argued in the preceding section, Korean policies towards external debt changed dramatically since 1981. This was likely to affect the relationship between debt inflows and economic performance variables. The coefficients of debt may be distorted if calculated for the whole period 1965-1986, i.e., neglecting the structural break in 1981.

- Distortions may also arise from short-term effects of the two oil price shocks which caused economic growth and domestic savings to decline temporarily. Simultaneously, soaring current account deficits in 1974/75 and 1979/80 were financed by additional debt inflows in order to keep investments high and sustain imports (Park, 1986, p. 1030). Lower economic growth and domestic savings went along with higher inflows of short-term debt, private debt, and loans from commercial sources particularly.

Dummy variables were included in the regressions in order to account for these factors. With regard to the re-orientation in debt policies, the slope dummy D1 was introduced for total debt inflows in 1981-1986. The effects of the oil price shocks on savings and growth were captured by slope dummies for DEBT (D2), DEBT-S (DS2), DEBT-Pr (DPR2), and DEBT-Ba (DBA2) for the years 1974/75 and 1979/80.

3. Empirical Results

The estimates of equations (3) presented in Table 1 support the reasoning on the importance of government regulations in influencing the economic performance effects of capital inflows in the case of Korea. As was to be expected, the investment equations reveal a significantly positive impact of debt. However, the relationship between debt inflows and the investment ratio became negative in the 1980s. This is reflected by the negative coefficient of the dummy variable D1, which captures the recent change in Korean policies towards external debt. Korea succeeded to

Table 1: Impact of Capital Inflows on Investment, Savings, and Growth in Korea, 1965-1986

Endogenous variables	Const. a_0	FDI a_1	AID a_2	DEBT a_3	D1 a_4	D2 a_5	T a_6	$R^2(\bar{R}^2)$	DW
I[a]	30.59***	0.37	1.19	0.34*	-0.42*	-	-	0.84(0.81)	1.33
	(6.63)	(0.16)	(0.47)	(1.96)	(-2.06)				
I	15.59***	-3.18	0.27	0.47**	-0.39*	-	0.79***	0.87(0.83)	1.31
	(3.10)	(-1.20)	(0.23)	(2.32)	(-1.79)		(3.40)		
DS	30.21***	-7.40***	-5.17***	-0.58***	-0.63**	-0.14	-	0.90(0.87)	1.82
	(23.49)	(-2.94)	(-10.00)	(-2.96)	(-2.22)	(-0.69)			
DS	16.56**	-3.27	-2.34	0.03	-0.98***	-0.37*	0.65**	0.92(0.89)	1.95
	(2.63)	(-1.11)	(-1.72)	(0.10)	(-3.26)	(-1.79)	(2.20)		
GR	9.31***	0.30	-0.64	0.32	-0.77	-0.83**	-	0.38(0.18)	2.15
	(4.57)	(0.07)	(-0.78)	(1.02)	(-1.69)	(-2.62)			
GR	18.11	-2.36	-2.46	-0.08	-0.54	-0.67*	-0.42	0.40(0.16)	2.21
	(1.61)	(-0.45)	(-1.01)	(-0.13)	(-1.02)	(-1.82)	(-0.80)		

For the definition of variables, see the text and the Appendix.

[a] Corrected for first-order autocorrelation of the residuals. - t-values in parentheses. - * Significant at the 10%-level. - ** Significant at the 5%-level. - *** Significant at the 1%-level.

Source: IMF, Balance of Payments Yearbook, various issues; Economic Planning Board (1987); Bank of Korea (1984); OECD, Geographical Distribution of Financial Flows to Developing Countries, various issues; own calculations.

maintain or even increase high investments although further debt inflows were strongly discouraged. A negative relationship was thus to be expected for the recent past.

In contrast to debt, the coefficients of aid and fdi remain insignificant in the investment equations (Table 1). This is mainly due to the minor role of these types of capital inflows in the external financing of Korea. The country no longer benefitted from substantial amounts of foreign aid since the late 1960s; and government policies towards fdi were restrictive over much of the period under consideration. Additionally, the privileged treatment of approved fdi in the 1970s is responsible for the insignificant coefficients of fdi to the extent that it induced a crowding out of domestic investors.

The relevance of government regulations is also evident from the insignificant coefficients of all types of resource inflows in the growth equation. The efficiency of investments was negatively affected by the following factors particularly:

- public repayment guarantees;
- negative real costs of foreign borrowing;
- the allocation of loans and fdi to large-scale enterprises in heavy and chemical industries;
- the preference on joint ventures with minority stakes of foreign investors.

The relationship between capital inflows and domestic savings in Korea should be interpreted with considerable caution. The significantly negative coefficients in the first savings equation are probably due to mis-specification. In contrast to the investment and growth equations, the results are strongly affected if the trend variable T was included as a proxy for neglected variables. Taking T into account, all capital inflow variables are rendered insignificant. This result is in line with a recent study on the determinants of domestic savings in Korea which

found foreign savings to be insignificant in the 1965-1981 period (Yusuf/Peters, 1984, p. 21)[1]. Arguably the single-equation ordinary least squares technique applied is inadequate for the savings equation because of simultaneous equation problems. In the case of Korea, high and stable investments were of first priority. Foreign capital inflows, especially foreign loans, were treated as a residual filling the gap between desired investment and available domestic savings. Consequently, foreign capital inflows were not fully exogenous.

Due to the small volume of aid and fdi inflows and the impact of government regulations it proved difficult to test the hypothesis that Korea provides an example of cooperative agent-principal relations. Table 2 presents F-tests confronting the restricted versions of equations (3) with the unrestricted versions of Table 1. The comparison between a_1 and a_2 is the crucial one for determining the type of equilibrium reached in transfer negotiations. Table 2 indicates that a_1 is not significantly different from a_2 so that neither the hypothesis of cooperative relations nor the counter-hypothesis of non-cooperative relations can be rejected. Moreover, all three capital inflow variables do not show any significant differences in their investment and growth impact. The strict control of the inflow and usage of foreign funds by the Korean government and particularly the similar set of regulations governing debt and fdi equalized the economic performance effects of different sources of external finance.

Basically, the aforementioned conclusions can be maintained if debt inflows are differentiated according to the maturity of loans and the type of borrowers and lenders (Table 3). With only two exceptions, the coefficients of fdi and aid remain insignifi-

[1] The same study identified overall economic growth, the inflation rate and real interest rates as the most important determinants of domestic savings.

Table 2: Constraint Tests

Endogenous variables	$a_1 = a_2 = a_3$	$a_1 = a_2$	$a_1 = a_3$	$a_2 = a_3$
I	F(2,16) = 0.05	F(1,16) = 0.07	F(1,16) = 0.01 E-02	F(1,16) = 0.9
DS	F(2,16) = 28.64*	F(1,16) = 0.84	F(1,16) = 7.16*	F(1,16) = 57.10*
GR	F(2,16) = 0.54	F(1,16) = 0.06	F(1,16) = 0.02 E-03	F(1,16) = 0.99

For the estimated equations, see Table 1 and the text. The results are based on the equations without trend variable. The results remain the same when T is included, except for the savings equation. * Significant at the 5% level.

Source: See Table 1.

cant[1]. The government's leverage in determining the use and thus the efficiency of debt inflows is most evident from Section B of Table 3. In contrast to foreign loans directly raised by the public sector, the impact of private sector loans on overall investment is positive, although significant slightly above the 10 per cent level only. However, the F-test reveals that the investment responses of DEBT-Gv and DEBT-Pr fail to be significantly different (Table A10). Moreover, the growth impact of both debt variables remains completely insignificant, as was the case for total debt.

[1] The exceptions refer to the negative coefficients of fdi (in the investment equation) and aid (in the savings equation) when debt is differentiated according to the type of creditor. The former result is totally implausible in economic terms; the same applies to the negative coefficient of debt from official sources (DEBT-Mu) in the same equation. These results may be partly due to data problems. DEBT-Mu and DEBT-Ba were only available since 1967 so that regressions had to be run on a reduced number of observations. Moreover, from the insignificance of the trend variable it appears that mis-specification of the equation could not be avoided in Section C of Table 3 by considering T as a proxy of neglected variables; in contrast to Section C, T is highly significant in both the investment and savings equations when debt is differentiated with regard to maturity and type of borrower.

Table 3: The Structure of External Financing and Economic Performance in Korea[a]: The Impact of the Maturity of Debt and the Type of Borrowers and Creditors, 1965-1986[b]

Endogenous variables	Const. b_0	FDI b_1	AID b_2	DEBT-L b_3	DEBT-S b_4	D1 b_5	D2 b_6	DS2 b_7	T b_8	R^2 ($\bar{R}^2$)	DW
A. Maturity of debt											
I	9.44 (1.64)	-2.19 (-0.86)	1.17 (0.98)	1.08** (2.85)	0.18 (0.74)	-0.57** (-2.54)	-	-	1.08*** (4.05)	0.90 (0.85)	1.54
DS	10.93* (1.90)	-2.49 (-0.99)	-1.54 (-1.28)	0.67 (1.75)	-0.69 (-1.31)	-1.04*** (-3.93)	-	-0.25 (-0.49)	0.90*** (3.37)	0.95 (0.92)	1.84
GR	8.57*** (4.56)	-0.69 (-0.19)	-1.03 (-1.35)	0.94** (2.31)	-1.33 (-1.61)	-0.60 (-1.43)	-0.20 (-0.50)	-	-	0.52 (0.33)	1.99
GR	9.18*** (5.06)	-1.37 (-0.40)	-1.08 (-1.51)	0.77* (1.92)	-0.46 (-0.50)	-0.82* (-2.01)	-	-1.32 (-1.51)	-	0.58 (0.41)	1.94
B. Type of borrower											
Endogenous variables	Const. c_0	FDI c_1	AID c_2	DEBT-Gv c_3	DEBT-Pr c_4	D1 c_5	D2 c_6	DPR2 c_7	T c_8	R^2 ($\bar{R}^2$)	DW
I^c	14.83** (2.93)	-1.66 (-0.73)	1.97 (1.24)	-0.03 (-0.06)	0.37 (1.75)	-0.21 (-0.89)	-	-	0.85*** (3.43)	0.89 (0.84)	1.48
DS	15.59** (2.50)	-3.69 (-1.21)	-2.05 (-1.51)	0.53 (0.75)	-0.02 (-0.05)	-1.07*** (-3.55)	-	-0.43 (-1.59)	0.69** (2.33)	0.93 (0.90)	1.83
GR	8.81*** (4.05)	-0.76 (-0.18)	-0.29 (-0.31)	1.17 (0.97)	0.11 (0.27)	-0.86* (-1.80)	-0.72* (-2.06)	-	-	0.40 (0.16)	2.03
GR	9.00*** (4.28)	-0.55 (-0.13)	-0.49 (-0.53)	0.91 (0.76)	0.23 (0.56)	-0.87* (-1.91)	-	-0.98** (-2.39)	-	0.44 (0.22)	1.96
C. Type of creditor											
Endogenous variables	Const. d_0	FDI d_1	AID d_2	DEBT-Mu d_3	DEBT-Ba d_4	D1 d_5	D2 d_6	DBA2 d_7	T d_8	R^2 ($\bar{R}^2$)	DW
I^c	28.54*** (5.48)	-4.92** (-2.30)	0.43 (0.19)	-1.52** (-2.72)	0.09 (0.29)	-0.19 (-0.85)	-	-	0.23 (0.91)	0.90 (0.84)	1.49
DS	21.02*** (3.24)	-1.78 (-0.64)	-4.14** (-2.51)	-0.99 (-1.12)	0.69 (1.46)	-1.15*** (-3.98)	-0.49*** (-3.21)	-	0.38 (1.32)	0.92 (0.87)	2.15
GR	8.26** (2.75)	-0.75 (-0.15)	-1.29 (-0.81)	0.97 (0.94)	0.57 (0.64)	-0.88 (-1.61)	-0.73** (-2.59)	-	-	0.40 (0.13)	2.07
GR	8.28** (2.64)	-0.86 (-0.16)	-1.15 (-0.70)	0.95 (0.88)	0.50 (0.53)	-0.84 (-1.46)	-	-1.98** (-2.28)	-	0.35 (0.06)	2.17

[a] For the definition of variables, see the text and the Appendix. t-values in parentheses; * significant at the 10 per cent level; ** 5 per cent level; *** 1 per cent level. - [b] 1967-1986 for the differentiation with regard to the type of creditors. - [c] Corrected for first-order autocorrelation of the residuals.

Source: IMF, Balance of Payments Yearbook, various issues; Economic Planning Board (1987); Bank of Korea (1984); OECD, Geographical Distribution of Financial Flows to Developing Countries, various issues; World Bank, World Debt Tables, various issues; own calculations.

The positive impact of debt inflows on the investment ratio is mainly due to long-term credits (DEBT-L). The results reported in Section A of Table 3 indicate that short-term debt (DEBT-S) was largely used to maintain planned investments when the domestically available resources were insufficient. Furthermore, long-term debt had a positive impact on economic growth, whereas the coefficients of DEBT-S are (insignificantly) negative. The latter result is noteworthy because the effects of the oil price shocks are captured by the dummy variables D2 and DS2 and should, therefore, not influence the coefficients of DEBT-S. Nevertheless, there is only weak support for the hypothesis that long-term debt was used more efficiently than short-term loans. As in all other growth equations, the differences between DEBT-L and DEBT-S are shown to be insignificant by the constraint tests presented in Table A9. This again points to the role of government regulations in equalizing the efficiency and productivity of different resource inflows.

V. Summary and Conclusions

It was the principal aim of this paper to identify empirically the effects of fdi, debt and aid inflows on investment, domestic savings and economic growth. According to the underlying model on international transfer negotiations, Korea was considered as an example of cooperative agent-principal relations. Consequently, the investment and growth responses of both fdi and debt inflows were supposed to be stronger than in the case of aid. The counter-hypothesis of non-cooperative agent-principal relations claimed that the economic performance effects of fdi were smaller than the impact of aid.

Neither of these hypotheses could be rejected with much confidence by the empirical estimates. This was partly due to the fact that fdi and aid played only a marginal role in the external financing of Korea. In the case of fdi, this was caused by the

restrictive approval procedure of Korean authorities. Generally, the economic performance effects of resource inflows were strongly influenced by the institutional framework governing these inflows and government regulations affecting the use of foreign funds. This is in line with the proposition on the dominant role of the government in determining the efficiency of capital inflows in Korea.

A high investment ratio was of first priority for the Korean government throughout the whole period under consideration. Moreover, efforts were intensified to mobilize domestic investment funds, as reflected in the secular rise of the savings ratio. Foreign capital inflows were regarded as a source to fill the gap between desired investment and domestically available resources in the first place. The government heavily intervened into the allocation of debt and fdi inflows, especially by tightly regulating financial markets. Preferential access to foreign finance and the subsidization of these funds represented crucially important measures in this respect.

Especially during the 1973-1979 period, the bulk of foreign funds were channelled to large-scale enterprises operating in heavy and chemical industries. The focus on heavy industrialization diminished the growth impact of capital inflows in the short run at least. The incentives to use foreign funds efficiently were further weakened in various ways. In the case of fdi, the officially favoured minority participation of overseas investors in joint ventures, the selective and discriminatory approval system, stop-and-go attitudes in its application, and - once approved - the preferential tax treatment of foreign over domestic investors were noteworthy. Tax privileges even gave rise to a crowding out of domestic investments. In the case of debt, publicly issued repayment guarantees rendered it dispensable for both the creditor banks and capital recipients to carefully evaluate the productivity of investment projects. Moreover, real costs of borrowing abroad were negative until the 1980s.

All in all, government interventions can be blamed for having impaired the efficiency of foreign resource inflows. The effects of different types of resource inflows on economic growth were equalized since fdi and debt were governed by a similar set of regulations. However, economic growth of Korea continued to be high in international perspective due to the high investment ratio and successful mobilization of domestic savings. Apparently, foreign creditors were confident that the country was prepared to engage in cooperative agent-principal relations. This is indicated by the fact that loans were easily available for Korea in international financial markets at rapidly improving conditions.

The costs of official credit allocation and subsidization became evident in the early 1980s only, when Korea experienced a drastic though temporary setback in economic growth. The authorities recognized that the favourable economic performance was difficult to sustain if the subsidization of heavy industries was to be continued.

The subsequent policy re-orientation involved the revision of debt and fdi policies. Real costs of foreign borrowing became positive. Recently, further debt inflows were strongly discouraged by the government; outstanding debt has been reduced since 1986. On the other hand, the restrictive attitude towards fdi has been liberalized. The engagement of foreign investors in Korea was encouraged by implementing an automatic approval system and introducing a negative list of industries reserved for domestic investors which has been reduced annually.

Two major effects are to be expected from these policy changes. First, the external financing structure of Korea will shift towards the pattern considered as optimal by the agent-principal model under cooperative transfer conditions. Given risk-averse agents and cooperative transfer relations, the agent should prefer fdi over debt inflows. This is because the trade-off between

economic growth and income stability, characterizing fdi inflows in the case of non-cooperative agent-principal relations, is avoided. In other words, the same growth effects can be achieved with less risk by relying on fdi rather than debt.

Secondly, the policy re-orientation is well-suited to improve the efficiency of foreign capital inflows. However, additional measures are required in this respect. Financial markets in Korea remained segmented although interest rate differentials among industrial sectors were substantially reduced since 1982. In 1986, curb market rates were more than twice as high as bank lending rates. The government's leverage on the decision making of Korean banks continued to be strong, although state-owned commercial banks were privatized in the 1980s. In order to strengthen the accountability and managerial responsibility of financial institutions, the liberalization of interest rate policies should be intensified and must encompass both lending and deposit rates. Publicly issued credit guarantees should be abolished. Only if the banks face sufficiently strong incentives to carefully assess the profitability of projects investment funds will be allocated to the most efficient use.

The liberalization program is to be extended to capital markets in Korea in order to accelerate and facilitate the desirable shift towards more equity participation and to further improve the efficiency of capital inflows (for detailed suggestions in this respect, see Iqbal, 1988a; 1988b). Remaining restrictions concerning equity participation of foreign investors should be abolished to widen the potential of risk sharing, to attune the servicing of foreign obligations to the ability to pay, and to diversify the sources of external funding. Moreover, the liberalization of capital markets helps to meet the changing lender preferences, e.g. the current trend towards securitization in international financial markets. Most importantly, portfolio investments by overseas investors should be encouraged through the promotion and reform of the Korean stock market. Currently,

the engagement of foreigners in Korean capital markets is largely restricted to indirect forms, especially through the Korea Fund, i.e. a closed-end investment fund which was offered to the general public as well as institutional investors in mid-1984. A direct engagement of foreign investors in listed Korean securities should be allowed as soon as possible. The same refers to the possibility of Korean enterprises to list their shares on major international stock exchanges and offer their shares for public subscription in the Euro-equity market.

Finally, the empirical analysis of the Korean case suggests possible ways as to how to elaborate on the underlying agent-principal model. Above all, a closer investigation is required with regard to the institutional framework governing the import and use of foreign capital and its consequences for the decision-making process of foreign principals on the terms of capital transfers. This may help to clarify in which way capital recipients can signal most effectively and credibly that they are prepared to engage in cooperative agent-principal relations. In this context, it is necessary to consider agent-principal relations within the recipient country as well, particularly the interrelations between the government and the private sector.

Appendix 1: Definition of Variables

The Balance of Payments Statistics published by the International Monetary Fund are the source of the following variables:

FDI: Gross foreign direct investment in Korea

DEBT-L: Long-term debt inflows to the resident official sector, deposit money banks and "other" sectors

DEBT-S: Short-term debt inflows to the resident official sector, deposit money banks and "other" sectors

DEBT: Sum of long and short-term debt inflows

DEBT-Gv: Government debt is proxied by the sum of net short and long-term debt flows to the resident official sector

DEBT-Pr: Includes short and long-term debt flows to deposit money banks and other sectors

The Geographical Distribution of Financial Flows to Developing Countries issued by the OECD provides the data for the aid variable:

AID: Consists of grants only

In the case of non-guaranteed private debt the available data allows to discriminate among creditors for some years only. Since debt from official sources designed to private borrowers is of negligible size total non-guaranteed private debt is assumed to originate from private creditors. Debt inflows according to the type of creditor are taken from the World Debt Tables published by the World Bank.

DEBT-Mu: Net inflows of public and publicly guaranteed debt from official sources

DEBT-Ba: Net debt inflows from private sources include public and publicly guaranteed credits from suppliers and financial markets plus non-guaranteed private debt

The figures for the endogenous variables are taken from Economic Planning Board (1987) and Bank of Korea (1984).

GNP: Gross national product at current market prices

GR: Annual growth rate of real GNP

I: Investment ratio (gross fixed capital formation as percent of GNP)

DS: Savings ratio (domestic savings as percent of GNP)

The following dummy variables are used:

D1 = DEBT for 1981-1986
0 for all other years

D2 = DEBT for 1974, 1975, 1979, 1980
0 for all other years

DS2 = DEBT-S for 1974, 1975, 1979, 1980
0 for all other years

DPR2 = DEBT-Pr for 1974, 1975, 1979, 1980
0 for all other years

DBA2 = Debt-Ba for 1974, 1975, 1979, 1980
0 for all other years

Table A1: Time Series Data for Endogenous and Exogenous Variables, 1965-1986[a]

Year	I	DS	GR	FDI	DEBT	AID
		per cent			US-$ million	
1965	14.8	7.0	5.8	0.0	1.0	134.0
1966	20.2	11.1	12.7	13.0	190.0	122.0
1967	21.4	10.7	6.6	11.0	289.0	134.0
1968	25.0	14.1	11.3	1.0	475.0	119.0
1969	25.8	17.6	13.8	-3.0	720.0	102.0
1970	24.7	16.2	7.6	66.0	661.0	83.0
1971	22.5	14.5	9.1	39.1	744.3	63.2
1972	20.4	15.7	5.3	63.0	425.6	49.9
1973	23.2	21.4	14.0	93.0	512.5	35.8
1974	25.6	19.3	8.5	104.6	1637.9	67.3
1975	25.3	16.8	6.8	53.4	2411.3	66.8
1976	24.4	22.2	13.4	75.0	1714.5	153.6
1977	27.3	25.4	10.7	72.4	1253.8	52.5
1978	31.3	27.3	11.0	61.3	1993.3	36.3
1979	33.2	26.5	7.0	36.2	5333.5	40.1
1980	32.3	20.8	-4.8	7.8	5616.8	50.8
1981	28.7	20.5	6.6	101.4	4574.0	80.2
1982	30.5	20.9	5.4	68.4	4073.8	53.0
1983	31.3	25.3	11.9	69.5	2194.7	26.7
1984	31.3	27.9	8.4	111.7	2425.2	25.6
1985	30.8	28.6	5.4	230.5	734.2	22.3
1986	31.3	32.8	12.5	428.2	-4564.8	10.6

[a] For the definition of variables see Appendix 1.

Source: International Monetary Fund, Balance of Payments Yearbook, various issues; Economic Planning Board (1987); The Bank of Korea (1984); own calculations.

Table A2: Discrimination in Access to and Average Costs of Borrowing between Subgroups of the Manufacturing Industry, 1972-1984

		1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Differences in access to loans (percentage points)[a]	Small - Large firms	-18.45	-17.00	-21.20	-13.56	-6.38	-0.59	-2.67	-2.72	-5.46	-4.50	1.61	0.43	2.56
	Domestic-market oriented - Export-oriented firms	-2.50	-4.20	-6.85	-8.45	-3.20	-4.23	-5.31	-5.86	-16.90	-12.79	-9.07	-7.44	-6.29
	Light industry - Heavy and chemical industry	-6.91	-0.42	7.79	3.44	-1.27	-2.48	-5.66	-0.28	-2.56	-6.96	-0.68	-0.67	-1.25
Differences in average costs of borrowing (percentage points)[b]	Small - Large firms	2.18	3.11	0.92	2.73	2.59	1.89	3.64	-0.26	2.32	0.47	-0.70	-0.76	-0.32
	Domestic-market oriented - Export-oriented firms	1.40	0.06	1.06	2.78	0.91	0.37	-0.43	-1.90	5.02	4.55	4.04	1.98	2.29
	Light industry - Heavy and chemical industry	2.78	2.25	0.21	1.92	3.56	2.79	5.76	4.11	2.47	2.15	1.64	1.70	0.07

[a] Measured as differences in ratios of total bank loans and foreign loans over total assets of each sector. - [b] Measured as differences in interest paid plus discount divided by total borrowing (foreign loans, bonds, etc. included).

Source: Bank of Korea, Financial Statement Analysis, various issues.

Table A3: Share of Branches Open to Foreign Direct Investment[a], 1984 (per cent)

Agriculture, Forestry and Fishery	12.8
Mining	50.0
Manufacturing	86.3
Food and Beverages	59.7
Textiles and Leather	91.5
Wood and Wood Products	88.0
Paper and Paper Products	75.7
Chemicals, Petroleum, Rubber and Plastic Products	84.7
Non-metallic Mineral Products	
Basic Metal Industries	100.0
Fabricated Metal Products, Machinery and Equipment	90.7
Miscellaneous	96.9
Electricity, Gas and Water Supply	50.0
Construction	93.5
Retail and Wholesale Trade, Restaurants and Hotels	65.2
Transportation, Warehousing and Communication	19.6
Finance, Insurance, Real Estate and Business Services	34.4
Social and Personal Services	46.2
Others	0
Total	69.0

[a]In per cent of total branches in each sector; calculated on the basis of the negative list of branches in which fdi is prohibited.

Source: Ministry of Finance (1984).

Table A4: Cost of Capital, 1966-1986 (period average, per cent)[a]

	1966-70	1971-75	1976-80	1981-83	1984-85	1986
Domestic bank lending rate (nominal)[a]	24.4	17.0	18.0	12.5	10.0	10.0
Curb market interest rate (nominal)	54.2	40.1	41.3	30.6	24.4	23.1
Foreign interest rate (nominal)[b]	7.2	7.9	9.3	13.3	9.7	6.9
Exchange rate depreciation[c]	5.1	7.8	5.5	10.0	14.8	-3.0
Domestic inflation rate (GDP deflator)	14.6	19.8	20.7	9.8	3.8	2.4
Interest rate differential between home and foreign markets[d]	12.1	1.3	3.2	-10.9	-14.5	6.1
Real private cost of borrowing abroad[e]	-2.3	-4.1	-5.9	13.6	20.7	1.5

[a] Discounts on bills of deposit money banks. - [b] Ninety-day LIBOR (London interbank offered rate). - [c] Bank of Korea standard concentration rate.- [d] Computed as domestic bank lending rate minus foreign interest rate minus exchange rate depreciation. - [e] Computed as foreign interest rate plus exchange rate depreciation minus domestic inflation rate.

Source: Collins/Park (1987b, Table 3.6).

Table A5: Cost of Bank Lending for Manufacturing Industries, 1970-1984[a]

Year	Average (per cent)	Variance (percentage points)
1970	17.92	83.18
1971	18.40	55.73
1972	15.05	43.14
1973	11.49	14.38
1974	12.47	17.56
1975	13.59	15.60
1976	14.58	16.13
1977	15.16	18.95
1978	15.52	14.50
1979	17.17	21.44
1980	20.47	20.99
1981	19.50	13.20
1982	16.89	8.33
1983	14.33	8.05
1984	14.46	5.91

[a] Based on data for 68 industries according to the 4-digit code classification of Korea Standard Industry Classification (KSIC).

Source: Cho/Cole (1986, p. 32).

Table A6: Structure of Borrowed Funds of Corporate Business Sector, 1965-1984[a]

	1965-69	1970-74	1975-79	1980-84
		(per cent of total)		
Indirect Financing	47.4	55.9	56.5	53.0
Banks	37.5	40.4	35.9	23.8
Non-banks	9.9	15.0	20.6	26.4
Government Loans	-	0.5	0.1	2.8
Direct Financing[b]	14.6	20.8	23.0	41.0
Foreign Debt	37.9	23.3	20.4	6.0
Total	100.0	100.0	100.0	100.0
thereof:				
Government-Controlled Financing[c]	75.4	64.2	56.4	32.6

[a] Averages of flows. Non-corporate enterprises and government enterprises are included since 1980. - [b] Includes stocks, bonds, and commercial papers. - [c] Includes banks, government loans, and foreign debt.

Source: Bank of Korea (1985a).

Table A7: Foreign Loans by Destination, 1966-82 (per cent of total)

	1966-70	1971-75	1976-80	1981-82
Agriculture, Forestry and Fisheries	11.4	13.0	6.7	9.2
Mining	1.0	-	0.1	0.2
Manufacturing industries	39.8	38.8	39.4	15.2
Heavy and chemicals	(22.7)	(26.3)	(30.8)	(12.8)
Light industries	(17.1)	(12.5)	(8.6)	(2.4)
Social Overhead	39.5	29.8	38.8	55.5
Services	6.5	13.4	14.5	14.4
Other	1.8	5.0	0.3	5.3
Total (million US$)	1693.2	4523.2	11810.5	5734.1

Source: Collins/Park (1987b, Table 3.11).

Table A8: Industrial Composition of FDI Flows to Korea, 1962-1984 (per cent of total)

	1962-1984	1962∿66	1967∿71	1972∿76	1977∿81	1982	1983	1984[a]
Agriculture, Fishery & Mining	1.3	0.5	1.2	1.5	1.4	1.4	0.5	0.6
Manufacturing	74.6	99.5	83.1	80.1	69.2	90.8	67.7	60.6
Food	2.7	0.5	1.2	0.4	2.9	3.6	7.3	7.5
Textiles	8.8	3.8	13.9	21.0	0.4	3.1	0.0	0.9
Chemicals	17.8	21.6	13.1	9.9	30.6	31.7	4.7	4.4
Drugs & Pharmaceuticals	2.7	1.4	0.7	0.7	0.5	7.9	12.1	0.7
Fertilizers	2.8	45.9	10.9	3.8	0.3	0.0	0.0	0.0
Petroleum	4.0	23.5	10.5	6.1	2.5	0.7	0.1	0.0
Metal	4.4	0.0	5.5	5.9	4.9	0.8	1.7	0.1
Machinery	7.8	1.4	3.2	6.3	8.2	10.9	14.4	9.4
Electric and Electronics	15.9	0.0	11.6	15.3	12.1	22.4	24.1	26.7
Transportation Equipments	3.6	0.0	0.3	6.3	2.4	5.1	2.4	0.0
Others	4.1	0.5	12.1	4.2	4.2	4.4	0.7	1.0
Services	24.1	0.0	15.7	18.6	29.6	8.2	32.1	38.7
Financing	3.9	0.0	2.7	2.0	5.8	2.0	2.1	7.8
Hotel and Tourism	12.9	0.0	7.8	13.1	11.2	4.7	16.6	25.6
Other Services	7.3	0.0	5.2	3.5	12.5	1.5	13.4	5.3

[a] Jan. to Nov.

Source: The Bank of Korea (1985b).

Table A9: Contraint Tests: Long-term versus Short-term Debt

Endogenous variables	$b_1 = b_2 = b_3 = b_4$	$b_1 = b_2$	$b_1 = b_3$	$b_1 = b_4$	$b_2 = b_3$	$b_2 = b_4$	$b_3 = b_4$
I	F(3,15) = 2.23	F(1,15) = 3.00	F(1,15) = 1.89	F(1,15) = 0.92	F(1,15) = 0.08E-01	F(1,15) = 0.74	F(1,15) = 3.42
DS[a]	F(3,15) = 2.91	F(1,15) = 0.24	F(1,15) = 1.78	F(1,15) = 0.52	F(1,15) = 5.04*	F(1,15) = 0.51	F(1,15) = 3.84
GR[b]	F(3,15) = 1.94	F(1,15) = 0.09E-01	F(1,15) = 0.19	F(1,15) = 0.03	F(1,15) = 3.94	F(1,15) = 0.08	F(1,15) = 4.51
GR[a]	F(3,15) = 1.31	F(1,15) = 0.07E-01	F(1,15) = 0.37	F(1,15) = 0.06	F(1,15) = 3.92	F(1,15) = 0.33	F(1,15) = 1.09

[a] For the estimated equations see Table 3, Section A and the text. - * Significant at the 5 per cent level. - [a] Including DS2. - [b] Including D2.

Source: See Table 3.

Table A10: Contraint Tests: Government versus Private Debt

Endogenous variables	$c_1 = c_2 = c_3 = c_4$	$c_1 = c_2$	$c_1 = c_3$	$c_1 = c_4$	$c_2 = c_3$	$c_2 = c_4$	$c_3 = c_4$
I	F(3,15) = 1.14	F(1,15) = 2.48	F(1,15) = 0.51	F(1,15) = 0.86	F(1,15) = 1.52	F(1,15) = 1.02	F(1,15) = 0.53
DS[a]	F(3,15) = 1.51	F(1,15) = 0.43	F(1,15) = 1.77	F(1,15) = 1.66	F(1,15) = 4.48	F(1,15) = 2.97	F(1,15) = 0.45
GR[b]	F(3,15) = 0.53	F(1,15) = 0.01	F(1,15) = 0.16	F(1,15) = 0.04	F(1,15) = 1.50	F(1,15) = 0.11	F(1,15) = 0.54
GR[a]	F(3,15) = 0.55	F(1,15) = 0.02E-02	F(1,15) = 0.10	F(1,15) = 0.04	F(1,15) = 1.49	F(1,15) = 0.36	F(1,15) = 0.22

[a] For the estimated equations see Table 3, Section B and the text. - * Significant at the 5 per cent level. - [a] Including DPR2. - [b] Including D2. - [c] Corrected for first order autocorrelation of the residuals.

Source: See Table 3.

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